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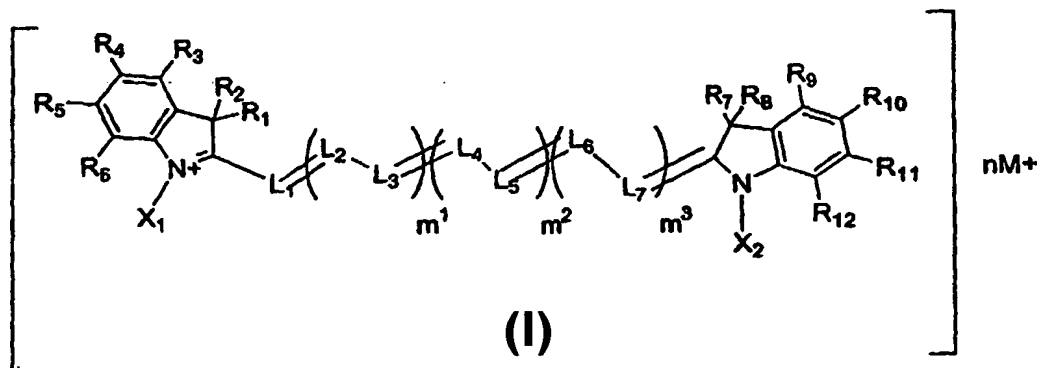
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[Continued on next page]

(54) Title: NEAR INFRARED FLUORESCENT CONTRAST AGENT AND METHOD FOR FLUORESCENCE IMAGING



(57) Abstract: A near infrared fluorescent contrast agent which is excellent in permeability in a living tissue and enables specific imaging of tumor and/or blood vessel, comprising a compound represented by formula (I) or a pharmaceutically acceptable salt thereof, wherein R¹, R², R⁷, and R⁸ represent a C₁-C₁₀ alkyl group or the like; R³, R⁴, R⁵, R⁶, R⁹, R¹⁰, R¹¹, and R¹² represent a hydrogen atom, a C₁-C₆ alkyl group, an aryl group or the like; X¹ and X² represent a C₁-C₁₅ alkyl group or an aryl group and X¹ and X² in total have 0 to 4 carboxyl groups; m¹, m², and m³ represents 0 or 1; L¹ to L⁷ independently represent a methine group; M represents a hydrogen atom, a metal, or a quaternary ammonium salt; and n represents an integer of 1 to 7 necessary for neutralizing charge.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/02358

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K49/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K C09B G03C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| E | EP 1 308 480 A (FUJI PHOTO FILM CO LTD) 7 May 2003 (2003-05-07) cited in the application Compounds 1.2.3.5-11.13-15.23.36.37.43-45.47 claims 5-11 | 1-8 |
| X | & WO 02 12398 A (FUJI PHOTO FILM) 14 February 2002 (2002-02-14) claims | |
| X | WO 97 13490 A (LICHIA KAI ;RIEFKE BJOERN (DE); HELDMANN DIETER (DE); DIAGNOSTIKFOR) 17 April 1997 (1997-04-17) cited in the application page 8, line 20-30 | 1-7 |
| | -/- | |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|--|-----------------------|
| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X,P | WO 02 32860 A (DORSHOW RICHARD B ;ACHILEFU SAMUEL (US); BUGAJ JOSEPH E (US); JIME) 25 April 2002 (2002-04-25) example 5.6 | 7 |
| X | EP 1 152 008 A (FUJI PHOTO FILM CO LTD) 7 November 2001 (2001-11-07) page 5, paragraph 18; claim 6.7 | 7 |
| A | DE 199 57 007 A (FEW CHEMICALS GMBH WOLFEN) 31 May 2001 (2001-05-31) | |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/02358

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1,2,3,4,5,6,7 relate to an extremely large number of possible compounds. In fact, the claims contain so many possible permutations and provisos that a lack of clarity (and/or conciseness) within the meaning of Article 6 PCT arises to such an extent as to render a meaningful search of the claims impossible. Consequently, the search has been carried out for those parts of the application which do appear to be clear (and/or concise), namely :

- $m1=m2=m3=1$,
- R1,R2,R7 and R8 are a methyl,
- R3-R6 and R9 to R12 can be every groupments,
- X1 and X2 can be every groupments or include $COO-(CH_2)_n-COO$.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP 03/02358

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
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